DH

1
00:00:17,029 --> 00:00:14,230
earth from over 200 miles above is an

2
00:00:19,429 --> 00:00:17,039
inspiring sight but this unique vantage

3
00:00:21,590 --> 00:00:19,439
point has practical value as well

4
00:00:23,670 --> 00:00:21,600
since the early 1970s a series of

5
00:00:26,630 --> 00:00:23,680
satellites looking at our planet has

6
00:00:29,029 --> 00:00:26,640
been producing highly valuable pictures

7
00:00:31,830 --> 00:00:29,039
these images colorized and enhanced with

8
00:00:34,389 --> 00:00:31,840
computers are used to monitor erosion

9
00:00:36,790 --> 00:00:34,399
urban growth and environmental changes

10
00:00:38,709 --> 00:00:36,800
and to identify certain types of crops

11
00:00:41,350 --> 00:00:38,719
and timber resources

12
00:00:43,510 --> 00:00:41,360
it's called multi-spectral scanning and

13
00:00:45,670 --> 00:00:43,520

thanks to research scientists like doug

14
00:00:47,830 --> 00:00:45,680
rickman at nasa's national space

15
00:00:50,310 --> 00:00:47,840
technology laboratories in basin louis

16
00:00:52,229 --> 00:00:50,320
mississippi satellite data processing

17
00:00:56,069 --> 00:00:52,239
techniques are now being applied to

18
00:00:58,709 --> 00:00:56,079
medical images like this one the goal

19
00:01:00,549 --> 00:00:58,719
improve disease detection and treatment

20
00:01:02,389 --> 00:01:00,559
capabilities

21
00:01:04,549 --> 00:01:02,399
one of the keys to this effort is a

22
00:01:06,710 --> 00:01:04,559
relatively new body scanning technique

23
00:01:08,950 --> 00:01:06,720
called magnetic resonance

24
00:01:11,109 --> 00:01:08,960
this particular mr unit is part of

25
00:01:13,270 --> 00:01:11,119
washington university's malintra

26
00:01:14,630 --> 00:01:13,280
institute of radiology in st louis

27
00:01:16,710 --> 00:01:14,640
missouri

28
00:01:19,190 --> 00:01:16,720
the patient is carefully positioned by a

29
00:01:21,109 --> 00:01:19,200
skull technologist then slid into a

30
00:01:23,749 --> 00:01:21,119
super strong magnet

31
00:01:26,149 --> 00:01:23,759
no harmful radiation is involved

32
00:01:28,550 --> 00:01:26,159
the mr generates images that look to the

33
00:01:30,550 --> 00:01:28,560
untrained eye like x-rays but there's a

34
00:01:33,270 --> 00:01:30,560
very important difference

35
00:01:35,830 --> 00:01:33,280
x-rays are most sensitive to bone

36
00:01:37,429 --> 00:01:35,840
mrs to other tissues in the body like

37
00:01:39,590 --> 00:01:37,439
the brain

38
00:01:42,069 --> 00:01:39,600

what brings nasa into the picture is the

39
00:01:44,390 --> 00:01:42,079
fact that the mr produces these images

40
00:01:46,710 --> 00:01:44,400
in digital form meaning they can be

41
00:01:48,710 --> 00:01:46,720
processed by a computer just like the

42
00:01:50,469 --> 00:01:48,720
picture information transmitted via

43
00:01:53,270 --> 00:01:50,479
satellite

44
00:01:55,350 --> 00:01:53,280
research scientists at nstl use their

45
00:01:57,590 --> 00:01:55,360
unique software package to assemble

46
00:02:00,389 --> 00:01:57,600
different black and white views produced

47
00:02:01,670 --> 00:02:00,399
by the scanner into a single composite

48
00:02:03,910 --> 00:02:01,680
image

49
00:02:05,749 --> 00:02:03,920
next color is added because we see

50
00:02:07,270 --> 00:02:05,759
things much better in color than in

51
00:02:09,510 --> 00:02:07,280
black and white

52
00:02:11,910 --> 00:02:09,520
color images like this can then be blown

53
00:02:14,550 --> 00:02:11,920
up and enhanced to bring out particular

54
00:02:16,470 --> 00:02:14,560
areas of concern to the physician

55
00:02:18,550 --> 00:02:16,480
much important information present in

56
00:02:20,390 --> 00:02:18,560
the standard black and white format is

57
00:02:22,470 --> 00:02:20,400
not clearly visible until these

58
00:02:23,990 --> 00:02:22,480
processing techniques are applied

59
00:02:26,550 --> 00:02:24,000
according to associate professor of

60
00:02:29,510 --> 00:02:26,560
radiology at washington university dr

61
00:02:32,070 --> 00:02:29,520
michael veneer what's happened with the

62
00:02:34,949 --> 00:02:32,080
use of the nstl satellite image

63
00:02:38,869 --> 00:02:34,959

processing technology is that now we're

64
00:02:41,910 --> 00:02:38,879
studying the examinations in a much more

65
00:02:43,830 --> 00:02:41,920
detailed way we can often contribute

66
00:02:45,830 --> 00:02:43,840
very significantly to the management of

67
00:02:47,589 --> 00:02:45,840
patient by answering questions we simply

68
00:02:49,350 --> 00:02:47,599
couldn't answer any other way

69
00:02:51,430 --> 00:02:49,360
the people at washington university are

70
00:02:53,509 --> 00:02:51,440
now setting up their own image analysis

71
00:02:55,509 --> 00:02:53,519
system the hope is that in the near

72
00:02:58,550 --> 00:02:55,519
future this technology will become a

73
00:03:00,869 --> 00:02:58,560
standard tool in patient evaluations

74
00:03:03,270 --> 00:03:00,879
we think that for certain selected

75
00:03:05,830 --> 00:03:03,280
examinations that

76
00:03:07,270 --> 00:03:05,840
the actual surgical procedure that's

77
00:03:09,270 --> 00:03:07,280
done on the patient

78
00:03:11,030 --> 00:03:09,280
or whether the decision whether or not

79
00:03:12,949 --> 00:03:11,040
to do surgery will be based on the

80
00:03:16,229 --> 00:03:12,959
results of this type of multispectral

81
00:03:18,630 --> 00:03:16,239
analysis and that's a remarkable finding

82
00:03:21,350 --> 00:03:18,640
in technology which has only been

83
00:03:24,070 --> 00:03:21,360
applied for the last year or so

84
00:03:26,630 --> 00:03:24,080
nasa's medical imaging effort helping